DISTRIBUTED APPLICATION NETWORKS

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CONSOLIDATED DELIVERABLES

JULY 17, 1984

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PARK 80 PLAZA WEST-1, SADDLE BROOK, NEW JERSEY 07662 (201) 368-9471

July 17, 1984

Mr. Alan Libove
Sperry Corp
Blue Bell, PA

Dear Alan:

As we discussed, I have put together a consolidated report which includes previously delivered deliverables, exclusive of the sets of presentation materials already delivered.

Sincerely,

Tom

Thomas O'Flaherty

TO:eh

Enclosure

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1. DAN/DSS DESCRIPTION

- Component Overview
- Expertise Required
- Phasing
- Communication Transport   Network Analysis

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2. MARKET SIZING

- Forecasts
- Industry Sizing
- Other Sizing
- Definitions

3. ACQUISITION-RELATED ISSUES

- Acquisition Criteria (final)
- Analysis of RCS Acquisition Candidates
- Analysis of Software Candidates
- Special Analysis of CINCOM
- Recommended Approach to Acquisition Target

1. DAN/DSS DESCRIPTION

- Component Overview
- Expertise Required
- Phasing
- Communication Transport Network Analysis

COMPONENT OVERVIEW

DISTRIBUTED SYSTEMS SERVICES

COMPONENT OVERVIEW

(Note: These are all products and services from which, separately and in combination, Sperry could generate revenues)

I. Software

II. Professional Services

III. Hardware

IV. Network-based services

I. SOFTWARE (IBM-compatible, Sperry/DSS developed, acquired or licensed)

A. Applications Software (Micro-mainframe segmented)

1. Industry-specialized (Interface to cross-industry software, use system software as foundation).

   a. Discrete Manufacturing (examples of applications)

      1. Manufacturing Resource Planning (BOMP, Inventory, etc.)

      2. Manufacturing Control (Receiving, inventory, scheduling, etc.)

      3. Department/Shop Monitoring/QA (at a minimum interfaces are required; it would be more desirable to offer in-house Spery/DSS products)

      4. Interfaces
         a. CAD
         b. Process automation/CAM/Robotics
         c. Financial/Marketing models

   b. Distribution (and Transportation industry aspects of Distribution)

      1. Industry sectors (not inclusive)

         a. Rail
         b. Motor
         c. Inland water
         d. Ocean shipping
         e. Warehousing
         f. Grocery
         g. Drug
         h. Liquor
         i. Electrical/Plumbing

        - j. Industrial Equipment
        - k. Apparel

    - 2. Functions
        - a. Distribution planning
        - b. Routing documentation (waybills, etc.)
        - c. Financial documentation (bill of lading, etc.)
        - d. Automated materilas handling interface
        - e. Cross-industry interfaces
        - f. Tariffs and rates

- c. Federal Government (Civilian)

    - 1. Specialized administrative, budgeting, accounting

    - 2. Agency-specialized applications, e.g.

        - a. Energy
        - b. Agriculture
        - c. Weather Bureau
        - d. NASA
        - e. Federal Aviation Administration
        - f. Case/file management (most agencies)

2. Industry-Specialized, Non-Target Industries (IBM-compatible: work with partner, e.g., joint venture, ad hoc licensee, act as agent, etc.)

3. Cross-Industry (Interfaced to applications)

    - a. Operations, e.g.,
        - 1. Purchasing
        - 2. Fixed Assets Control
        - 3. Human Resources
        - 4. Order entry
        - 5. Inventory (non-production)

- b. Finance/Accounting, e.g.,
  - 1. General Ledger
  - 2. Accounts Receivable
  - 3. Accounts Payable
  - 4. Payroll

- c. Financial Analysis, e.g.,
  - 1. Modeling/Forecasting
  - 2. Statistical Anlaysis
  - 3. Spreadsheets

- d. Administrative Support, e.g.,
  - 1. Document processing and retrieval
  - 2. Electronic Mail
  - 3. Project Planning and Management
  - 4. Graphics Support

B. Systems Software (Foundation for applications)

1. Sperry and IBM-compatible systems support software

   a. DBMS

   b. Languages/Development Tools

   c. Utilities

   d. Performance Measurement

   e. Fourth Generation Language

   f. Micro-Mainframe linkage

   g. Teleprocessing monitor

2. Translators for networked applications

- o Format translation software to provide framework for making logical or content translation of application data.

- o Protocol translation software to provide compatibility between different communications, operating system and ystems software environments.

a. Target segment variables

1. Multi-firm version
2. Single-firm version
3. Batch micros
4. Real-time micros

b. Non-target industry segments: Generalized core Format/Protocol translator

II. PROFESSIONAL SERVICES

A. Applications Development-Target Industries (Use software in section I as foundation for supplying services from feasibility study to implementation)

- o Discrete manufacturing

- o Distribution

- o Federal Government

B. Custom Networks (Data/Voice) Development

1. Needs analysis, feasibility studies

2. Design
3. Implementation
    a. Prime contractor

    b. Switch/computer supplier (Sperry, IBM or other)

    c. Physical link acquisition/construction (subcontract)

4. Facilities management

C. Customized Software Development (for networks, micro-mainframe applications)

1. Format/Protocol Translator

2. Systems software foundation

3. Applications software

4. Microcomputer processing

    a. batch
    b. real-time with host

D. Micro/End User Peripheral Support

1. IBM-compatible

2. Other (Sperry or contracted)

E. Network Support

1. Monitoring

2. Reconfiguration

3. Hardware fixes

F. Software Support

1. Application (Sperry-DSS supplied)

a. Industry-specific: Target segments

b. Cross-industry: All Segments

2. Systems Software (Sperry-supplied)

III. HARDWARE

A. Mainframes

1. Sperry

2. IBM-compatible

B. Network switches (Sperry/other)

C. Communication controllers

D. Terminals (Sperry, ASCII, 3270-compatible)

E. Micros

1. IBM-compatible
2. Other (e.g., UNIX-compatible)

IV. NETWORK-BASED SERVICES

A. Basic Remote Processing Services (processing; standard packages)

B. Access to Data Base Information Supplier

   1. Public Data Bases
   2. Proprietary (e.g., industry) data bases
   3. Data type examples:
      a. Target industry data, e.g.,
         1. Data internal to industry (e.g., order rates, company performance)
         2. External economic data affecting industry
      b. Investment-related data (e.g., company financial performance, stock data)
      c. Scientific/engineering
      d. Bibliographic

C. Transmission Facilities

   1. As a commodity (i.e., VAN services)
   2. As application network foundation (e.g., ATT Net 1000)

  - Intra-enterprise prospects improving, especially in P&C.

  - Competition:

    - PMS dominant in P&C; EDS in health; IBM in intra-segment P&C.

    - Widespread in other areas, but no dominance.

- Medical: Not recommended at this time (could be later target).

  - High potential intra-enterprise, but most enterprises small.

  - Few subsequent industry niches; little intra-segment or inter-segment potential.

  - Fair entry timing: DSS-type products implemented for some time.

  - Competition: Dominant suppliers, including an established DSS supplier (HBO and Company).

- Government: (Federal, state/local) recommended as add-on to established Sperry business.

  - Moderate intra-enterprise and intra-segment potential.

  - Many potential niches, but cohesiveness will need exmination.

  - Fair/Good entry timing: need exists, customer resources questionable.

  - Competition: Widespread with strong, but not, dominant firms.

MARKET SIZING

OTHER SIZING

INPUT

MARKET SIZING (OTHER THAN BY INDUSTRY SEGMENT)

- Potential hardware revenue for target segments (ie., Manufacturing, Distribution, Government).
- Intra-enterprise DSS as a proportion of all DSS.
- Sizing end-to-end vs. components.
- Customer size as a segmentation issue.

DSS HARDWARE REVENUE: POTENTIAL MARKET SIZE

	1984			1988		
	(a) TOTAL HARDWARE	(b) DSS %	(c) DSS HARDWARE	(a) TOTAL HARDWARE	(b) DDS %	(c) DSS HARDWARE
Computer Systems						
Micro Mainframe	$ 6.4	0.5%	$0.032	$ 10.0	27.5%	$ 1.47
Mini Mainframe	$ 6.4	0.5%	$0.032	$ 12.7	27.5%	$ 1.87
Workstations	$24.2	0.5%	$0.121	$ 45.7	27.5%	$ 6.72
Communication Systems	$ 2.3	0.5%	$0.012	$ 4.6	27.5%	$ .68
TOTAL	$39.3		$0.197	$873.0		$10.74

Key: (a) From Sperry Estimate.
(b) Target segment IS market/total IS market X midpoint DSS estimate.
(c) a X b

$ Billion

INTRA-ENTERPRISE DSS AS A PROPORTION OF ALL DSS

	1984	1988	COMMENTS
Manufacturing	95+%	75%	
Transportation	80%	50%	
Wholesale	90%	25%	
Retail	95%	55%	
Banking	75%	40%	50% in 1983 if merger restraints lifted.
Government	95%	75%	Slow change represents resource and political constraints.

DSS END-TO-END/COMPONENT ASSUMPTIONS

- For planning purposes, assume that 100% of the 1984 intra-segment and inter-segment market is end-to-end (because of novelty, etc.).
- Assume in 1988 that 75% of the intra-segment and inter-segment market will be end-to-end.
- For intra-enterprise market, assume that between 25% and 35% will be end-to-end.

DSS END-TO-END VS. COMPONENT MARKET POTENTIAL: 1984

	End-to-end Market							
	(a)	(b)	(c)		(d)		(e)	
	DSS Market	Intra/Inter Segment %	Intra-enterprise %		Total		Component Market %	
			Low	High	Low	High	Low	High
Manufacturing	$76	5%	24%	33%	29%	38%	62%	71%
Transportation	$ 3	20%	20%	28%	40%	48%	52%	60%
Wholesale	$15	10%	23%	32%	33%	42%	58%	67%
Retail	$ 8	5%	24%	33%	29%	38%	62%	71%
Banking	$49	25%	19%	26%	46%	51%	49%	54%
Government	$35	5%	24%	33%	29%	38%	62%	71%

Key: (a) Midpoint of INPUT forecast
(b) INPUT estimates (see separate sheets)
(c) (100 -b) X 25% (low); (100 -b) X 35% (high)
(d) b + c
(e) 100% -d

$ Millions

DSS END-TO-END VS. COMPONENT MARKET POTENTIAL: 1988

	End-to-end Market							
	(a)	(b)	(c)		(d)		(e)	
	DSS Market	Intra/Inter Segment %	Intra-enterprise %		Total		Component Market %	
			Low	High	Low	High	Low	High
Manufacturing	$5.95	19%	19%	26%	38%	45%	55%	62%
Transportation	$0.34	38%	13%	18%	51%	56%	44%	49%
Wholesale	$1.02	56%	6%	9%	62%	65%	35%	38%
Retail	$ .55	34%	14%	19%	48%	53%	47%	52%
Banking	$3.60	45%	10%	14%	55%	59%	41%	45%
Government	$2.35	19%	19%	26%	38%	45%	55%	62%

$ Billions

Key:
(a) Midpoint of INPUT forecast
(b) INPUT estimates (see separate sheets) X 75%
(c) (100 -b) X 25% (low); (100 -b) X 35% (high)
(d) b + c
(e) 100% -d

Distribution of DSS Prospects by Company Size

Desktop and micro-mainframe hardware estimates may underestimate market share of larger enterprises.

- See attached analyses of U.S. corporate sales, assets, and employee distribution in Exhibits I-III.
- Manufacturing is especially concentrated
- See specific analyses of insurance and banking sectors in Exhibits IV and V.

EXHIBIT I

U. S. BUSINESS UNITS AND ASSETS (1979)

ASSET SIZE (MILL)	NUMBER OF BUSINESS UNITS (THOUSANDS)	TOTAL ASSETS (BILL)	FORTUNE EQUIVALENT %
$ 0 - 0.1	13,583	249 (3%)	
0.1 - 0.0	2,326	635 (9%)	
1 - 10	244	468 (6%)	
10 - 25	15.3	241 (3%)	
25 - 50	7.3	258 (4%)	
50 - 100	4.4	311 (4%)	
100 - 250	3.0	462 (6%)	
250+	2.7	4,748 (65%)	
TOTAL	16,186	7,372 (100%)	70% (approx.)

NOTE: Assets unavailable for proprietorships and partnerships; sales used as surrogate - overall, sales to asset ratio is 3:4

SOURCE: IRS and Fortune

EXHIBIT II

U. S. CORPORATIONS SALES

	SALES (BILL)		
	TOTAL (1979)	FORTUNE (1979)	FORTUNE % OF TOTAL
MINING/MANUFACTURING	$ 2,286	$ 1,550	68%
TRANSPORT/UTILITIES	446	164e	37%
BANKING/INSURANCE	561	345e	62%
WHOLESALE/RETAIL	1,753	212e	12%
SERVICES	245	163e	66% *
CONSTRUCTION	253	-	
AGRICULTURE	53	-	
TOTAL	$ 5,597	$ 2,434	(43%)

NOTES: e = Estimated by applying deflator to more inclusive 1982 series

* = Overstated, some component companies belong in other sectors

SOURCE: IRS and Fortune

EXHIBIT III

U. S. EMPLOYMENT, BY SECTOR

SECTOR	EMPLOYMENT (MILLIONS) TOTAL (1979)	EMPLOYMENT (MILLIONS) FORTUNE (1982)	FORTUNE % OF TOTAL
o COMMERCIAL			
MINING/MANUFACTURING	20.2	17.5	87%
TRANSPORT/UTILITIES	6.4	2.7	42%
BANKING/INSURANCE	5.8	1.9	33%
RETAIL	15.9	3.3	21%
COMMERCIAL SERVICES	5.3	1.5	28%
WHOLESALE	3.8	*	
AGRICULTURE	3.5	*	
CONSTRUCTION	6.3	*	
SUBTOTAL	67.2	26.9	40%
o NON-COMMERCIAL			
MEDICAL	6.9	*	
EDUCATION	7.3		
CHARITABLE	1.5		
GOVERNMENT	5.1		
HOUSEHOLD	1.3		
SUBTOTAL	22.1	0	
o TOTAL	89.1	26.9	30%

* Several Companies in Fortune "Services" list

SOURCE: Statistical Abstract and Fortune

EXHIBIT IV

MARKET SIZING BY PREMIUM SIZE: PREMIUMS

SEGMENT SIZE (DIRECT COMMERCIAL LINES PREMIUMS)	ENTITIES* IN SEGMENT	PREMIUMS ($ BILL)	PERCENT OF PREMIUMS IN SEGMENT	PERCENT OF PREMIUMS CUMULATIVE
Over $1 billion	13	$23.5	45.8%	45.8%
$500-999 million	12	9.6	18.7	64.5
$300-499 million	10	3.7	7.2	71.7
$200-299 million	14	3.5	6.8	78.5
$100-199 million	26	3.9	7.6	86.1
$75-99 million	13	1.1	2.1	88.2
$50-74 million	18	1.1	2.1	90.3
$40-49 million	26	1.2	2.3	92.6
$30-39 million	25	0.9	1.8	94.4
$25-29 million	14	0.4	.8	95.2
$20-24 million	20	0.5	1.0	96.2
$15-20 million	21	0.4	.8	97.0
$10-15 million	39	0.5	1.0	98.0
$5-10 million	57	0.4	.8	98.8
$.1-4 million	284	0.6	1.2	100.0
Under $.1 million	60	0	0	100.0
TOTAL	652	$51.3	100.0%	-

* ENTITIES = GROUPS OR INDEPENDENT COMPANIES

EXHIBIT V

BANKING EXPENDITURES (1981)

	ASSET SIZE ($ MILL)			
	$ 0 - 49	$ 50 - 200	$ 201+	TOTAL
NUMBER OF BANKS	9900 (60%)	3850 (28%)	850 (4%)	14,600 (100%)
EDP EXPENSE PER BANK ($ MILL)	$ 1.2	$ 5.4	$30.5	-
TOTAL EDP EXPENSE ($ BILL)	$11.9	$20.8	$25.9	$58.6
COMMERCIAL INFORMATION SERVICE EXPENDITURES				
- %	3.75%	6.75%	10.1%	-
- $ (BILL)	$ .446 (10%)	$ 1.41 (33%)	$ 2.62 (58%)	$4.55 (100%

Typical Company DSS Market Sizing (Manufacturing)

1. Calculate the total DSS potential sale for companies of various sizes ($500 million, $1 billion, $4 billion) in a particular year, e.g., 1988.

2. To calculate DSS sales per company, first calculate DSS sale per employee for the manufacturing sector as a whole.

    (a) Assume manufacturing employment is essentially unchanged in 1988 (as it has been for some time), i.e. 20 million.

    (b) Assume DSS penetration in 1988 of 28%.

    (c) Multiply (a) x (b) to find employment in DSS-using enterprises, i.e. 5.6 million.

    (d) Divide 1988 Manufacturing DSS market size by (c), with the result being $1,062 per employee.

    (e) Assume the average manufacturing firm will have $200,000 of sales per employee in 1988 allowing for inflation and productivity (See Exhibit 6 for contemporary figures; note that variances between subsectors of manufacturing are very wide-Exhibit 7).

    (f) A $1 billion firm in 1988 will consequently have approximately 5,000 employees.

    (g) DSS market size for the $1 billion firm is 5,000 x $1,062 per employee or $5.3 million.

    (h) 1988 Component percentages applied to the total result in the following distribution.

        Software - 40%
        Processing - 30%
        Professional Services - 21%
        Turnkey (non-hardware) - 9%

    (i) The hardware component can be included when the proportion allocatable to the large company market has been agreed upon.

INPUTS view is that at least 75% of the manufacturing sector's share of micro-mainframes and workstations should be allocated.

EXHIBIT VI

SALES PER EMPLOYEE, BY INDUSTRY

	SALES/EMPLOYEE ($ THOUSANDS)
MINING/MANUFACTURING	$ 113
TRANSPORT/UTILITIES	70
BANKING/INSURANCE	97
WHOLESALE/RETAIL	90*
SERVICE	46

* = Wholesale is approximately $250,000 per employee

SOURCE: Exhibits 2 and 3

EXHIBIT VII

SALES PER EMPLOYEE, BY SELECTED MANUFACTURING SECTORS (1981 DATA)

SECTOR	SALES PER EMPLOYEE ($ THOUSANDS)
OIL REFINING	$ 513
MINING	303
CHEMICALS	119
MOTOR VEHICLES	79
AEROSPACE	70
ELECTRONICS	60
APPAREL	42

SOURCE: FORTUNE

DSS Core Company Evolution

1. Assume core company is software company

   - If a particular company (or companies), use specific characteristics

   - Otherwise, use public software company average (Attachment A)

2. Assume that DSS venture in 1988 will have distribution between components as follows (per INPUT component projections)

- Software	40%
- Processing	30%
- Professional Services	21%
- Turnkey (Non-hardware)	9%

3. Hardware component is not included, since this is a services company. It could be included, however.

4. Apply the percents in (2) above as weights against either:

   - The sector averages in Attachment A, or

   - Against the financial profiles of specific leading companies selected from Attachment A

   - The choice will depend on how aggressive the financial goals of venture will be.

HYPOTHETICAL DSS SALES TO $1 BILLION

MANUFACTURING COMPANY ($ MILLION)

TYPE	1984	1988	NOTES
Software (see attached)			
Host	$1.9	$2.9	A
Workstation (@ $1K/workstation)	1.8	2.7	A
Maintenance (@ 15%)	.6	.8	
Processing			
Electronic Data Interchange	.1	1.0	B
Information Data Base	.3	.6	B
Professional Services			
Network Installation (20 people over 2 years)	2.0	3.0	C
DSS/Network Maintenance (5 people indefinitely)	.5	.8	C
Turnkey (non-hardware): (Included under "Software" and "Professional Services")			

NOTES: A - 1984 figures grown @ 10% annually
B - Estimates
C - $100,000 per person in 1984; $150,000 per person in 1988

SOFTWARE (1984 PRICES)

TYPE	HOST PRICE	PRICE SOURCE	ASSOC. WORKSTATIONS (est)
Network Management	$300K	P	500
Systems Software	$500K	C	500
Manufacturing	$400K	C	200
Financial	$400K	C	
Gen'l Ledger			50
AIR			50
AIP			50
Purchasing, FA			50
Non-product Inv.			50
Modeling			150
Payroll	$100K	I	50
Personnel	$200K	I	100
Total	$1.9 mil		1,750

Key: C=Cincom; I=Information Sciences; P=Personal Knowledge

DEFINITIONS

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KEY DSS DESCRIPTIONS

- Intra-enterprise DSS, i.e., DSS functions within the same company, government agency or non-profit organization.

- Intra-segment DSS, i.e., that extant between enterprises within the same industry segment.

- Inter-segment DSS, that extend between enterprises that are in different industry segments.

- End-to-end sales include an item from each of the four groups below:

  - DSS software.

  - Sperry/DSS processing and/or Sperry/DSS communications or processing hardware.

  - Microcomputers and/or workstations.

  - Professional services/consulting.

- Component sales include only some of the end-to-end items.

3. ACQUISITION-RELATED ISSUES

- Acquisition Criteria (final)

- Analysis of RCS Acquisition Candidates

- Analysis of Software Candidates

- Special Analysis of CINCOM

- Recommended Approach to Acquisition Target

ANALYSIS OF RCS ACQUISITION CANDIDATES

INPUT

ADP NETWORK SERVICES

- Network Services are increasingly out of step with rest of company.
  - Obsolescant DEC hardware, while rest of company is IBM.
  - Rest of company has either an industry or functional focus.
  - Large into-ADP network linking IBM processing sites is outside of Network Services (?)
- Industry-oriented services "nutured" by Network Services are removed (Dealer, auto manufacturer, collision estimating).
- Network Services publicly referred to by ADP management as "slowest growing" part of ADP (under 10%).
- Banking is also "flat".
  - Recently combined with Network Services.
  - Reasons:
    - To find common solution?
    - To sell off as a package?
- Recently appointed head (1982, ex-IBM), seen as less aggressive than ADP standard.

CSC

- Never understand or done well in non-government markets.

- Current non-government market focus is fuzzy and non-synergistic (i.e., credit reporting, tax preparation, telephone company support, pharmacy claims, hospital internal systems, distribution support).

- INFONET has consistently lost money in spite of (because of ?) cost-cutting efforts.

  - Proprietary UNIVAC operating system can only be a weakness.

  - UNIVAC still core of value-added processing (i.e., no migration planned).

- Upper management turnover.

- Unwillingness/inability to plan.

- Company viewed as a series of hire and fire projects.

- Marketing effectiveness and morale questionable.

BOEING

- Internal work still a majority of business.
  - Internal and commercial processing and support intermixed (bad).
  - Internal and commercial networks will be combined (neutral).
  - Significant problems in management focus.
- BCS is functionally focussed, rather than industry or applications focussed.
- New plans call for selling.
  - Internally-developed Boeing software.
  - Education services (largely internally developed).
  - Communications services (VAN with some custom networking).
- President is ex-IBM.
  - Most of management is from Boeing, hurts commercial orientation.
  - BCS may be resting spot for some Boeing staff.

D&B COMPUTING (Former NCSS)

- NCSS acquisition in 1980 not a smooth one.
  - Top management left/replaced.
  - Technical turbulence.
- Pre-acquisition hardware company caused significant loss of focus.
- Role in D&B unclear:
  - An independent business unit?
  - A facilitator of other D&B network-based products and services?
- Excessive cost-cutting?

XEROX DATA SYSTEMS

- Manufacturing and (partially) distribution focussed.
- Recent and expensive ($100 million internal investment) manufacturing systems.
- President just left, remaining management position unclear.
- XDS position in Xerox organization increasingly isolated (especially after insurance acquisition).

OVERVIEW

	ADP Network Services	CSC	Boeing Computer Services	D & B Computing (NCSS)	Xerox Data Systems
Acquisition Strategy	Acquire all	(a) Acquire all (b) RCS only	Acquire IBM - based (Wash DC)	Acquire RCS (old NCSS) only	(a) Acquire all (b) Acquire IBM - based only
Availability	Probable	Probable	Possible	Recently for sale	Probable
FY 83 Revenues (e = Input estimate	$ 100 mill	(a) $ 695 mill (b) $ 168 mill	● Total non-captive $ 192 mill (e) ● Acquisition Target: Approx. $ 90 mill	$67 mill	(a) $ 94 mill (e) (b) $ 85 mill (e)
Customer Rating (Av = 3.13 out of 4)	3.19	3.17	3.31	3.10	

CUSTOMER FOCUS

	ADP Network Services	CSC	Boeing Computer Services	D & B Computing (NCSS)	Xerox Data Systems
Target Customer Size	Varies	Large	Large	Varies	Medium
Industry - Specialized					
Manufacturing	0	0	+2 (Eng)	0	+5 (complete)
Distribution	0	+4 (DARTS, IBM Based)	0	0	+3 (mfr-oriented)
Federal	0	+5 (Prof Svc)	+3	0	+1 (local Gov't)
Other	-2 (note A)	-3 (Pharmacy) -5 (Credit Union) -5 (Tax Prep.) -5 (Tel. Co.)	-2 (note A)	-2 (note A)	+5 (none)

Key: +5 = most desirable
-5 = least desirable (i.e. outside of Sperry focus)

Note A: Contractual commitments for one-of-a-kind custom systems

MARKET SHARES (1983)

	ADP Network Services	CSC	Boeing Computer Services	D & B Computing (NCSS)	Xerox Data Systems
RCS	1.5%	2.4%	2.8% (a) 1.0 - 1.5% (b)	1.0%	0.4% (est.)
Professional Services	-	10.0%	-	-	-
Software (Industry-specific)	-	-	-	-	1.5% (est.)

(a) Total non-captive
(b) Target portion

USER RATINGS (DATAPRO)

Ratings (1 = low, 4 = high)

Criteria	Average	ADP	CSC	BCS	D & B	Xerox	Criteria Importance*
Overall	3.08	3.19	3.17	3.31	3.10	NR	
Accessibility	3.28	3.53	3.20	3.75	3.00	NR	2.60
Cost	NR	NR	NR	NR	NR	NR	3.26
Response Time	3.08	3.41	3.33	3.47	3.00	NR	3.39
Application Packages	3.04	3.20	1.00**	3.27	3.44	NR	4.62
Technical Support/Training	3.06	2.90	2.50	3.01	2.95	NR	4.62
Information Data Bases	NR	NR	NR	NR	NR	NR	5.66
Languages	3.12	3.14	3.25	3.31	3.50	NR	NR
Control and Security	NR	NR	NR	NR	NR	NR	6.15
Number of Responses (High/Low)	1,010	17/16	6/1	16/15	10/9	NR	

NR = Not rated
* Importance 1 = High, 8 = Low
** Not meaningful

FINANCIAL

	ADP Network Services	CSC (note A)	Boeing Computer Service	D & B Computing (NCSS)	Xerox Data Systems
FY 83 Revenues	$100 mill	(a) $695 mill (all) (b) $168 mill (RCS)	(a) $192 mill Total (e) (b) $ 90 mill (target RCS-e)	$67 mill	$94 mill
Revenue Growth FY82 to FY83	6% (note B)	(a) 10% (b) 10%	(a) 13% (b) unknown	10% (e) (note D)	28%
Profitability	15-20% pre-tax (e)	(a) 4.7% pre tax; 2.6% AT (b) Unprofitable	(C)	Unprofitable	
ROE	N/A	13.8%	N/A	N/A	N/A
ROA (pre tax)	N/A	9.2%	N/A	N/A	N/A

(A) First 9 mos. of FY84: Revenue down slightly, profits up about 10%
(B) May not be totally comparable due to organization changer
(C) Not meaningful due to intra-BCA and intra-Boeing allocations

(D) May not be meaningful due to intra -company sales
(N/A= Not available
e = Input estimate

SALES/MARKETING

- CSC
  - Very successful at selling professional services to government.
  - Less successful at selling RCS services to government.
  - Least successful at selling RCS or professional services to commercial sector.
  - Good sales and marketing staff in lower and middle ranks.

- BCS
  - Sales staff for engineering and commercial/government markets intertwined.
  - Sales support staff mixed between those two functions plus internal support also.
  - Ex-IBMers role becomming more pronounced.
  - Trying to become more niche oriented; at very early stages.
  - Location of marketing management shifting from Washington, D.C. to Seattle.

- NCSS
  - Weak marketing direction.
  - Technical support problems.
  - Efforts divided between RCS sales & an essentially single product software effort (NOMAD 2).
  - Poor morale overall, many departures.

- XEROX

  - Staff cuts overall in 1982-83; marketing largely excepted.

    - Sales force: 70-80 people

    - Support: 50-60 people.

  - Software Main Focus.

    - Small systems (4321): Little competition.

    - Medium Systems (4361).

  - RCS picking up as economy improves.

  - Good telemarketing.

  - Good morale.

NETWORK CAPABILITIES

	ADP Network Services	CSC	Boeing Computer Services (Note A)	D & B Computing (NCSS)	Xerox Data Systems
Access Points	300	150	150	140	0 (note B)
Protocols	3780	3780	SNA/X·25 3780	3780	-
VAN	+3 (note C)	+1 (new)	+2 (Note D)	Internal	0 (note B)
Custom Experience	+3	+4 (Prof Svc Defense)	+3 (Note D)	0	+1
Distributed Services	+2 ("On-site", qualified success)	+1 ("Infostation" Sperry-based) +4 (Defense)	+1 (BITS, unsuccessful)	+1 (3200, unsuccessful)	+2 (intell. terms., PCs)

(A) May not be available because of integration with internal Boeing network
(B) No network per se; customers connected to Xerox processing on ad hoc basis
(C) Relatively small, much VAN-type activity in other parts of ADP
(D) Includes in-house capabilities

Key: +4 = most desirable
0 - least desirable

	ADP Network Services	CSC	Boeing Computer Services	D & B Computing (NCSS)	Xerox Data Systems
RCS	+2 (internal FM)	+1 (utility svs)	+3 (mixed env.)	+4 (Genl T/S)	+5 (industry-specific)
Software Experience	+2 (internal FM: applications transferred)	+5 (prof svc)	+3 (cross-industry)	+3 (pos: own FGL;neg:own op. sys.)	+5 (industry-specific)
Software Prods.					
Financial/ Accounting	0	+2 (Analytic)	+2 (Analytic)	0 (McC & Dodge)	+5 (complete)
Systems Software	0	+2 (licensee)	+3 (lic. + in-house	+3 (in-house)	+3 (licenced & integrated)
Other Capabilities (Negative Factor)					
RCS	-5 (DEC)	-5 (Sperry)	N/A	0	-2 (Xerox-phasing out)
Software Experience	-5 (DEC)	-10 (prop. Sperry)	N/A	0	-3 (Xerox; DEC turnkey)
Multi-Vendor Experience	+3 (internal conversions)	+5 (Prof svc)	+2 (internal)	0	+3 (internal conversion)

Key: +5 = most desirable
-10 = least desirable

SUMMARY

	ADP	CSC	BCS	D&B/NCSS	XEROX DS
Vertical Market Applications					
Manufacturing			*		+
Distribution					P
Federal Market		+	+		
IBM Experience		+	+	+	+
IBM-based RCS (general or specialized offerings)	-	-	+	+	+
Management	+	-		-	-

Key: + = Positive - = Negative P = Partial

* Value to acquisition doubtful since not comprehensive and dependent on Boeing Company for support

Recommendations

- ADP: Do not aquire.
  - Very good management.
  - But poor market/product fit: Minimal IBM and vertical market orientation.
- CSC: Approach only under cetain conditions.
  - Federal professional services market must become key medium term target for Sperry.
  - Entrenched CSC upper management will probably have to be changed.
    - Reverse prior commitment to proprietary Sperry-based operating systems for RCS business (people and money drain).
    - Find a workable strategy to improve financial performance.
    - Danger of becoming an unfriendly acquisition (would, therefore, not be viable).
  - Assess management gaps.
- Boeing: Approach to ascertain Boeing Corp. interest in divesting.
  - Key issue: Feasibility of splitting Boeing/non-Boeing operations, from standpoint of:
    - IBM processor hardware (Cray and CDC business would not be acquired).
    - Network.

    - Support staff, especially proprietary applications software support (e.g., manufacturing software).
  - Required: Active desire on part of Boeing Corporation management to sell most commercial operations and acceptance of DSS approach by BCS management.
  - Assess BCS staff, especially top management choosing to transfer; may need management stiffening.
- D&B Computing (NCSS): Approach D&B.
  - Should not be only acquisition.
    - Combine with Xerox Data Systems.
  - Assess:
    - Need for management stiffening.
    - Network upgrade needed.
    - Dependency on other D&B units' business.
  - Hard bargaining may be needed.
- Xerox Data Services: Approach Xerox.
  - Add to other acquisition, especially if D&B
  - Assess kind of management stiffening required.
- Parallel Steps.
  - Conduct search for DSS management talent (individuals, teams).

- Investigate acquisition of communications consulting company, depending on RCS acquistion situation.

- Continue search for specialized companies/divisions, e.g., those active in Electronic Interchange. Examples:

  . Informatics Distribution Processing Division (Columbus, Ohio).

  . Comtrac (freight billing auditing/payment service firm; division of First of Chicago).

ACQUISITION CRITERIA

FINANCIALS	IMPORTANCE
Revenues	Medium
Growth rates (preferably by line of business)	High
Profitability (ROR)	Medium
Pretax ROE (more than 12% after tax)	High
Expected future cash flows	High

ORGANIZATION & MANAGEMENT	IMPORTANCE
• Stability	High
• Depth	High
• Flexibility/Futures Orientation	High
• Congruence of company strategy and DSS approach	High

MARKETING & SALES CAPABILITIES	IMPORTANCE
• Leader or Follower?	High
• "System" or problem solving sales orientation	High
• Target industry knowledge/orientation	Medium
• Distribution network	High
- Sales force size/type	
- Ability to handle new products.	

NETWORK-BASED SERVICES CAPABILITIES	IMPORTANCE
• Basic RCS	Medium
• Data base information supplier	
- General	Low
- DSS Target industry	High
• Transmission facilities	
- VANS	High
- Existing	High
- Planned	High
• Network-based industry applications	
- DSS Target industries	High
- Other	Medium

SOFTWARE PRODUCTS	IMPORTANCE
• Industry-specialized	
- Target industries	High
- Other	Medium/low
• Cross-industry applications	High
- IBM mainframe Systems Software (foundation)	High
• DSS system software	High
- Format/protocol translater	
- Micro-mainframe links	
- Microcomputer processing	
. Batch	
. Real time (with host)	

PROFESSIONAL SERVICES CAPABILITIES/EXPERTISE	IMPORTANCE
• Applications Development experience	
– Target industries	High
– Other	Medium/Low
• Custom Network Development	High
• DSS-related system software experience	High
• Other custom software development	Medium
• Systems support/maintenance	
– Hardware	Low
– Network	High
– Software	Medium
• Expertise	
– Operating systems	Medium
– Systems software	High
– Communications protocols	High

ANALYSIS OF SOFTWARE CANDIDATES

COMPANY ASSESSMENTS (1=LOW, 5=HIGH)
VERTICAL MARKET SOFTWARE

MSA	CULLINET	CINCOM
Acquired Arista manufacturing software from Xerox (1982)	Viewed as a critical opportunity	Applications products generally viewed as secondary opportunity area (about 5% of sales
Partially integrated with mainframe products	Actively offering IDMS-based manufacturing and banking applications	
Moderately successful	Moderately successful in manufacturing software	Using Cincom systems software as foundation
	Two false starts in banking	
	Acquired banking software firm which uses IDMS (Bob White Computing June 1984)	
2.0	3.5	3.0

COMPANY ASSESSMENTS (1=LOW, 5=HIGH)

SYSTEMS SOFTWARE

MSA	CULLINET	CINCOM
None offered by MSA	IDMS now outsells IMS 3-1	TOTAL is largest selling DBMS (4,000 plus sales)
Marketing agreements with ADR may produce closer functional ties to system software eventually	IDMS/R could be a product/marketing breakthrough (still has bugs)	TOTAL is obsolete; the TIS replacement is selling reasonably well but is far behind IDMS in market share
	Offers a full set of productivity and support tools	Offers a full set of productivity and support tools
	Not involved in traditional, lower priced system software (languages, etc.)	Not involved in traditional, lower priced systems software (languages, etc.)
		Recently bought license to sell an Austrailian network management system
1.0	4.0	4.0

COMPANY ASSESSMENTS (1=LOW, 5=HIGH)
CROSS-INDUSTRY APPLICATION SOFTWARE

MSA	CULLINET	CINCOM
The "original" financial software vendor; extremely successful Offers a full set of financial applications	Cullinet bought source code rights rights from McCormack and Dodge and integrated these financial applications with IDMS moderately successful in sales	In 1984 Cincom introduced 2 financial application modules developed in-house and integrated with Cincom systmes software
Software often perceived as obsolescent; an increasing problem	McCormack and Dodge software commonly perceived as being technically more advanced than MSA	Other modules will be introduced over the next two years
	Computer Pictures acquisition (1982) put Cullinet into mini/micro turnkey graphics market	
4.0	4.0	2.5

COMPANY ASSESSMENTS (1=LOW, 5=HIGH)

MICRO SOFTWARE

MSA	CULLINET	CINCOM
Acquired Peachtree Software in 1981	Downloading link and integrated micro packages announced in April 1983	Obtained license to Executec's integrated micro package; in May 1984 little current in-house knowledge
Mainframe and micro application linkages planned but not yet implemented		
	IDMS/R problems have delayed link release	Now offering a micro-mainframe link product, PC contact May 1984
Micro-Mainframe generalized link package released in 1982 (one of first)	Source code obtained for spreadsheet and word processing; problems in integration have delayed product release	
4.0	3.0	2.0

COMPANY ASSESSMENTS (1=LOW, 5=HIGH)

PROFESSIONAL SERVICES

MSA	CULLINET	CINCOM
Large support, development and maintenance organizations Avoids custom work or consulting	Large support, development and maintenance organizations Generally, avoid custom work or consulting 1981-1982 efforts to go into the RCS business have given Cullinet more of a professional service orientation	Large support, development and maintenance organization In the past, had a very active professional services unit; this is being deemphasized
1.0	1.5	2.0

COMPANY ASSESSMENTS (1=LOW, 5=HIGH)

ORGANIZATION AND MANAGEMENT

MSA	CULLINET	CINCOM
John Imlay, founder, is not involved in day-to-day operations. Active in ADAPSO and recently named Best Dressed Businessman	John Cullinane, founder is still actively involved in firm's management; not a one-man band	Tom Nies, founder, still plays a dominant role in company management
Imlay has built up a strong, stable, deep management team	Cullinane has developed, largely from long-term staff, a competant and broadly-based management team	Management depth and breadth questionable
Neither Imlay nor any other person is irreplaceable	Cullinane's loss would be felt, but company would still do well	
5.0	4.0	3.0

MARKETING

MSA	CULLINET	CINCOM
MSA is a marketing company, par excellence	Cullinet still has ties to its early scrambling traditions (a positive point)	Historically, have spent a lower percent of revenues on marketing than its major competitors
	Still learning how to sell a full, complex product line	
	Originated and perfected the free seminar sales technique	Number of sales staff unchanged during 1976-1982; sales increase is a tribute to productivity, but overall strategy was misguided.
5.0	4.0	3.5

COMPANY ASSESSMENTS (1=LOW, 5=HIGH)

FINANCIAL

MSA	CULLINET	CINCOM
Recent public offerings produced strong cash position; usually conservative financial management Margins under pressure Disappointing recent stock market performance	Recent public offerings produced strong cash position; conservative financial management Good margins and ROE	Private company status has meant essentially, a bootstrap operation: low asset and equity base ROA and ROE adequate (but against low bases) Margins relatively low, partly because of accounting policies which postpone revenue High proportion of rental (as opposed to sale) produces stable cash flow
3.5	4.5	3.0

COMPANY ASSESSMENTS (1=LOW, 5=HIGH)

GENERAL ORIENTATION

MSA	CULLINET	CINCOM
Acquisition is an important part of company recent product expansion (Arista, Peachtree) Balance between marketing and technical arms may be weighted too much toward marketing	Acquisition has been a method to expand into specialized areas (Computer Pictures, Bob White) However, major product entry strategy has been to acquire source code and modify (financial software manufacturing, earlier banking software, spreadsheet, word processing); this enables Cullinet to integrate products and knowledge Excellent marketing and technical balance	Acquisition has not been part of Cincom's strategy, due to lack of cash if nothing else Cincom has begun to be a licensee to fill product gaps (network management, micro packages) Balance between marketing and technical arms may be weighted too much toward technical areas
4.0	4.5	3.5

SUMMARY

	MSA	CULLINET	CINCOM
Vertical Market Software	2.0	3.5	3.0
Systems Software	1.0	4.0	4.0
Cross-Industry Applications Software	4.0	4.0	2.5
Micro Software	4.0	3.0	2.0
Professional Services	1.0	1.5	2.0
Organization and Management	5.0	4.0	3.0
Marketing	5.0	4.0	3.5
Financial	3.5	4.5	3.0
General Orientation	4.0	4.5	3.5
TOTAL (Unweighted)	29.5	33.0	26.5

SPECIAL ANALYSIS OF CINCOM

ANALYSIS OF CINCOM FINANCIAL POSITION

A. CINCOM'S DIFFERENCES

On the surface Cincom's financial position seems much at variance with that of other leading companies, e.g., Cullinet and MSA. However, the underlying financial performance and ratios may be much more similar if the following Cincom characteristics are taken into account:

- Cincom has been basically a "bootstrap" operation: It has not gone public and does not have the healthy (?) cash/investment position of the other two companies. Because of this, it is also the only one of the three to have significant debt (See Balance Sheet items in Exhibit I).

- Over 60% of Cincom's revenues come from rental, as opposed to one-time payments. According to Cincom's analysis, this is much higher than for other firms. This postpones revenue (and profits).

- Cincom has stated that as a private company it wishes to minimize income tax by accelerating expense and postponing revenues (as above).

These factors are important in interpreting the sketchy data available on Cincom (since it is a private company).

B. BALANCE SHEET DATA (EXHIBIT I)

On first glance the asset data (from Dun and Bradstreet) seem too low. However, when only the A/R and property/equipment items are examined its ratio of revenue to assets is very close to the others:

- Cullinet: 2.0 to 1
- MSA: 2.2 to 1
- Cincom: 2.3 to 1

Cincom does not have the cash hoards of the others that directly impact assets as well as indirectly creating assets out of software via acquisition.

Cincom's equity and working capital are very low compared to the others. This obviously impacts its operational flexibility and forces it to add outside products by license and distribution rights rather than purchase.

C. OPERATING DATA (EXHIBIT 2)

The biggest problem area in analyzing Cincom is to estimate its profits. The only current guide is a public statement by Nies giving 1982 profits as 28% ROE and 35% return on working capitol; as noted in Exhibit 1, these were quite modest for 1983 and were probable not significantly different for 1982.

Applying the 1982 percents to the 1983 data gives a profit range of between $1.4 and 2.2 million. Taking another tack, if 1982 working capital was $5 million and equity $6 million, this would indicate a profit about $1.75 million.

With the release of TIS, some of the R&D drain has been removed, so profits have probably improved somewhat; hence, a 1983 estimate of $2.5 million (profits tripled from 1981 to 1982, undoubtedly reflectly the end of the all-out -- $30 million -TIS development cycle).

D. RETURN ON ASSETS AND EQUITY (EXHIBIT 3)

Even with a much lower total asset base, Cincom's ROA is not a good as Cullinet's, although roughly equivalent to MSA's. Obviously, Cincom's ratios should be treated as approximations since both the numerator and denominator are partially derivations - however, the broad picture is clear.

The ROE is impressive in one sense. However, it points out the relatively fragile condition of the company, since the ratio is only favorable because of a low "E", not a high "R".

F. CONCLUSIONS

It is obvious that Cincom could not be taken public without careful long-term planning, i.e., over several years the rental proportion of revenues would have to be pushed down in order to improve profitability. (This would probably also be wiser from a long-term business strategy standpoint as software becomes more like hardware in its propensity to become obsolete.)

It is true, though, that the on-going rental income does provide a good cushion (equal to about one year's revenues).

If Cincom were examined more closely, it would be desirable to restate its sales so that one-time sales were closer to the industry average (which is about the reverse of Cincoms).

- This would improve profitability.

- It is possible, however, that Cincom's revenue growth rate might decline, depending on the mix of old and new products.

EXHIBIT I

1983 BALANCE SHEET DATA ($ MILLIONS)

	CULLINET	MSA	CINCOM (NOTE)
ASSETS			
Cash/Investments	$ 45.5	$ 87.3	$ 3.0e
A/R	27.0	45.1	20.6e
Current	72.5	132.4	23.6
Property/Equipment	11.6	16.9	10.0e
All other non-current	23.0	11.1	2.0e
Total Assets	$ 107.1	$ 160.4	$ 35.6
A/R, Property	38.6	62.0	30.6
LIABILITIES			
Current	$ 25.0	$ 33.6	$ 19.7
Deferred Taxes	3.3	1.9	2.0e
Debt	0	.6	6.2
Total	$ 28.3	$ 36.1	$ 27.9
Equity	$ 78.8	$124.3	$ 7.7
Working Capital (note)	$ 47.5	$ 98.8	$ 3.9

NOTE: Cincom data from D&B reports to Sperry; source of estimates (e) described in narrative. Working capital data also from D&B.

EXHIBIT II

OPERATING DATA ANALYSIS ($ MILLION)

	CULLINET	MSA	CINCOM
Revenues	$ 78.6	$ 139.1	$ 70.8
Income			
Before Tax	$ 20.8	$ 19.1	$ 4.0e
After Tax	11.6	10.8	2.5e
Margins			
Before Tax	$ 26.5%	13.7%	5.6%
After Tax	14.8%	7.8%	3.5%

EXHIBIT III

RETURN ON ASSETS AND EQUITY (1983)

	CULLINET	MSA	CINCOM (NOTE)
Return on Total Assets			
- Before Tax	19.4%	11.9%	11.2%
- After Tax	10.8%	6.7%	7.0%
Return on Equity			
- Before Tax	26.4%	15.4%	52%
- After Tax	14.7%	8.7%	32%

NOTE: See narrative for estimating process for CINCOM

RECOMMENDED APPROACH TO ACQUISITION CANDIDATE

APPROACH TO ACQUISITION TARGET

- Assume target will have little knowledge/image of Sperry.
  Give mini-presentation on:
  - Technical competance
  - Financial resources
  - Expansion into new areas of opportunity (lead-in to DSS)
- Present DSS concept and strategy, stress:
  - Key element on mid/long term Sperry strategy
  - Importance of DSS trend and size
  - Need for broad, integrated offerings
    - Technical
    - Marketing
  - Software products/firm as keystone/foundation
    - Technical
    - Marketing
    - Management
  - Add other acquisitions, if necessary
- Reasons for Sperry seeing ______________________ as foundation [tailor to fit]
- What __________ brings to DSS venture

  - Expandable (to DSS) product line
  - Services-oriented marketing organization
  - Management team core for DSS business

- What Sperry brings to DSS venture

  - DSS concept and management/financial means to bring it about
  - Experience in starting new technological initiatives
  - Investment resources

- Relationship of Sperry and ________________

  - ________________ will build DSS organization by:
    - Adding staff in particular areas (e.g., ____________________)
    - Acquiring other firms in particular areas (e.g., communications consulting firm)
    - Transferring specific individuals/units from within Sperry (e.g., communications network capabilities)
  - DSS organization will report to Sperry as shown in Exhibit A.
  - DSS organization will not necessarily have same compensation, personnel practices, etc., as Sperry, but will have those best suited for a services organiztion (i.e., probably similar to those which ________________ now has).

- Sperry wishes to maintain strategic control while giving DSS venture maximum operational and tactical independence in what will be a rapidly changing, new market opportunity.

- Annual DSS financial and product plans, with quarterly reviews and updates.

- Defined position for Sperry-supplied hardware in DSS offerings.

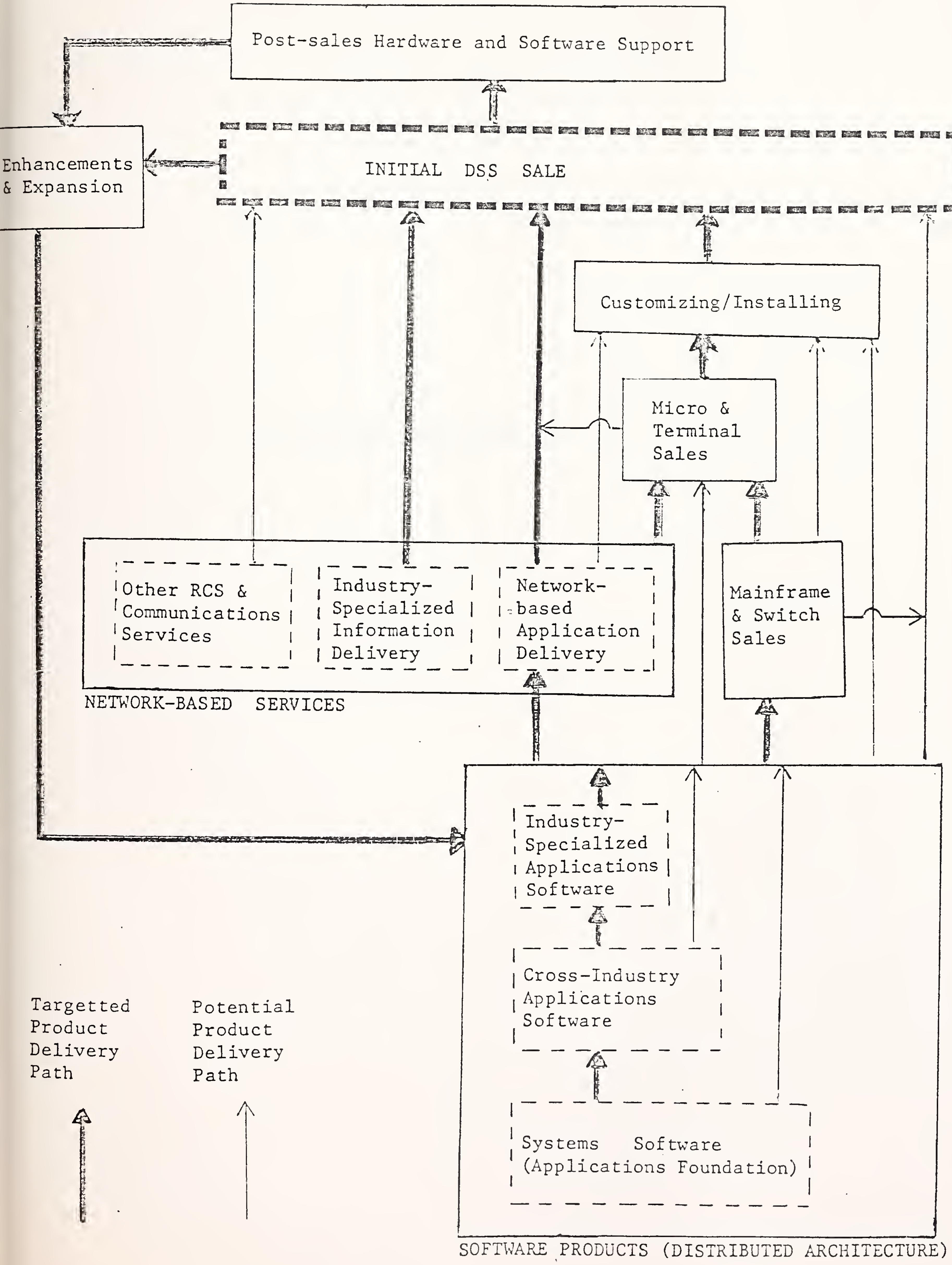
- Joint marketing, as appropriate.

a. Sperry/DSS developed applications

b. Client-developed applications (using Sperry/DSS building blocks)

D. Industry Applications Network

o End-to-end solution consisting of software, hardware and professional services and either a custom proviate network and Sperry/DSS transmission service.


Post-sales Hardware and Software Support
Enhancements & Expansion
INITIAL DSS SALE
Customizing/Installing
Micro & Terminal Sales
Other RCS & Communications Services
Industry-Specialized Information Delivery
Network-based Application Delivery
NETWORK-BASED SERVICES
Mainframe & Switch Sales
Industry-Specialized Applications Software
Cross-Industry Applications Software
Systems Software (Applications Foundation)
SOFTWARE PRODUCTS (DISTRIBUTED ARCHITECTURE)
Targetted Product Delivery Path
Potential Product Delivery Path

EXPERTISE REQUIRED

EXPERTISE REQUIRED

I. Operating Systems

1. Sperry
2. IBM
    - A. 370/300/4300: MVS, VM, DOS/VSE (primary)
    - B. 8100/Series 1/System 34-38 (secondary)
3. Micro (MS-DOS, CP/M, UNIX)

II. Systems Support Software

1. Production DBMS (IMS, IDMS, TOTAL, ADABAS)
2. Relational DBMS/4th Generation Language (DB2, IDMS/R, FOCUS, RAMIS II, NOMAD 2, NATURAL.
3. Teleprocessing environment: TSO, CICS, VMS

III. Communications Protocols

1. SNA/SDLC
2. 3270 Bisync
3. X.25
4. IBM Batch (2780, etc.)
5. DCA/DIA

PHASING

INPUT

DISTRIBUTED SYSTEMS SERVICES: PHASING

PHASE I

- RCS firm acquisition will bring:
    - Basic processing services (processing capacity, software tools - languages, modeling, etc.)
    - Access to some information data bases.
- The RCS firm will also have some or possibly all of the following:
    - A data network (which will probably need some upgrading).
    - Industry-specialized software (although not necessarily in all-or any-of Sperry's-DSS target segments).
    - Some network consulting capabilities.
    - Some applications consulting capabilities.
    - IBM systems software and communications expertise.
    - Services, sales and support force.
- Sperry will be able to supply ASCII terminals and IBM-compatible micros to the RCS firm's existing clients, although it is not anticipated that this will result in a high volume busines.
- Both Sperry and the acquisition should continue, and expand, their custom network business, while planning to ultimately merge into the Sperry-DSS business.

PHASE 2

- The RCS acquisition and its management will be the focal point for expanding into the DSS business. Technical capabilities will be expanded by additional hiring or acquisisiton, as required, in these areas:

  - IBM communications.

  - IBM Operating Systems.

  - IBM-based Systems Software.

  - IBM-compatible Micro Software

  - Data bases aimed at initial target industry segments.

- The main priority in this phase will be to gain applications capability by hiring, licensing, acquisition or internal development in the initial target industry segments. This will include:

  - Industry-specialized software (by acquisition or license).

  - Professional services to modify, install and support such software in a networked environment.

  - Industry-specialized data base information.

  - Licensed cross-industry and systems support software to serve as a foundation to these software installations.

  - A generalized format/protocol translator to serve the single firm hub installations (often multi-divisional organizations) that would be communicating to many secondary locations in their own organization and/or secondary locations in other organizations.

- Network services will be expanded to fill any page in the RCS firm's products.

PHASE 3

- Phase 3 will essentially be an expansion of Phase 2 in terms of:
    - Target segments.
    - Complexity of application networks handled.
- New target segments.
- The format/protocol translator software will be expanded to handle multiple firms of equal standing (i.e., host to host) in industries that have agreed on or implemented common data and communications standards.
- The network will be upgraded further in terms of locations served, capacity and/or flexibility, as required.
- The time between phases 2 and 3 will be determined chiefly by resources available (for going into additional segments) and technical improvements required (for the protocol software and network capabilities). In principle, the time between phases 2 and 3 could be quite short.

PHASE 4

- Phase 4 is largely a potential phase that will be dependent on business and technical developments.
- In prior phases, micros may be given very significant amounts of work to do, but this will be on a batch basis, as opposed to real-time interaction with host files (see exhibits). Whether real time processing will have to be offered will depend on:

  - The amount of real and perceived need in the target segments.

  - The degree to which the technical problems can be solved and the overhead needed to do so.

- Such real time processing will almost certainly require significant changes to:

  - The industry-specialized application software.

  - The associated cross-industry and systems support software.

  - Parts of the network as well.

- Sperry will also have to decide whether to offer DSS services to multi-firm units in industries without agreed-on data and communications standards. This will entail appreciably more effort in format and protocol conversion. The need for this will be determined by:

  - The technical and business knowledge gained in earlier phases.

  - Advances toward industry standards in target segments.

  - The success of other efforts (e.g., IVANS).

  - Size of segment opportunity.

- In this same approximate time period the need to support for a non-IBM standard micro computer (e.g., a UNIX-based one) should be known.

	PHASES			
SUMMARY	1	2	3	4
DSS Components				
Hardware (and associated support)				
Mainframes		X		
Communications		X		
Terminals	ASCII	3270 (A)		
Micros	IBM-compatible			IBM-non compatibl
Basic timesharing	X			
Information supplier	General*	Initial Target Segments	All Target Segments	
Network services	Existing*	IBM-based (A)		
Network consulting/support	Sperry-based existing*	Minimum (A)	Upgraded	(D)
Applications capability				
Industry-specialized software	Existing*	Initial Target Segments (B)	All Target Segments (C)	(D)
Prof. svs. (new sys and support)	Existing*	Initial Target Segments (B)	All Target Segments (C)	(D)
Batch micro-mainframe		X		
Real time micro-mainframe				X (D)
IBM-compatible software:				
X-industry, systems sw, micro sw	Existing*	X (B)		(D)
Format/protocol translator				
Single form hub		X		
Multi-firm (industry standards)			X	
Multi-firm (no industry standards)				X

Notes

* = Business of acquisition;
A-D = Letters in parenthesis show associated components

COMMUNICATION TRANSPORT NETWORK ANALYSIS

INPUT

PROPRIETARY COMMUNICATIONS TRANSPORT NETWORK: FACTORS

The attraction of having a communications transport network depends on an assessment of

- Three external factors.
  - Rate of change in technology.
  - Capacity.
  - Public network performance.
- Two internal factors
  - Traffic density.
  - Traffic stability.
- Rate of change in technology, i.e., worst case will be where new technology is introduced before the previous generation has paid for itself.
  - Examples:
    - ATT 1983 write off.
    - Computer processor generations.
  - Potentially high price paid if not an early innovator.
- Communications capacity projections over medium term (5-10 years).

- Factors causing overcapacity.
    - Increased physical capacity (fibre optic trunks, satellites).
    - Transmission efficiencies (e.g., voice compression).
    - Physical private networks justified on non-economic grounds (e.g., tariff anomaly-based bypass, quality control).
    - Replacement of host networks with partially distributed processing.
- Factors decreasing overcapacity.
    - Increased high band-width usage (e.g., teleconferencing).
    - Innovative forms of data transmission (e.g., intra-company, single terminal to multi-application transparency).

- Public network performance.
    - Issues:
        - ATT, RBOC, OCC connectivity and cooperation.
        - Politicizing of rates (e.g., access charge delay): impact on investment and public network quality, especially of ATT.
        - Ability of ATT to compete in unsheltered environment.
        - ATT management and organizational effectiveness.
    - Fears over public carrier performance are an increasing factor in private transport network planning.

  - However, use of specialized carriers and VANS could shield Sperry/DSS from some or many of these problems.

- Traffic Density must be at minimum levels to make investment in circuits and switches economic. In many-to-many DSS applications this may not be the case until traffic builds up system-wide, probably a long process.

- Equally important, traffic must be stable. Innovative DSS applications may not achieve such stability for some time, as vendor and customer alike learn to work in a new environment.

- Summary: The attractiveness of proprietary communications transport network varies:

  - Inversely with external factors, i.e., a proprietary transport network is less necessary where trhere is

    - High technology change.

    - Overcapacity.

    - Good public network performance.

  - Directly with internal factors, i.e., a proprietary transport network is more attractive where there is

    - High traffic densities.

    - Predicable traffic patterns.

Proprietary Communications Transport Network:

INPUT's Assessment of Factors

FACTOR	INPUT's ASSESSMENT	EFFECT ON ATTRACTIVENESS OF PROPRIETARY TRANSPORT NETWORK
Technological Change	Continued High Rate of Change	Negative
Capacity	Few capacity problems	Negative
Public Network Performance	Uncertain	Neutral (must work with VANS, etc.)
Traffic Density	(a) High for intracompany (b) Low/medium for intercompany	(a) Neutral - vendor proprietory network often in wrong place (b) Initially negative
Traffic Stability	(a) High for intracompany (b) Initially low for intercompany	same as above

PROPRIETARY COMMUNICATIONS TRANSPORT NETWORK:

PROS AND CONS

PROS	CONS
1a. Potential lower operational costs	1a. Higher initial investment
	1b. Possibly forces ongoing investment to avoid obsolescense.
2. Sell excess capacity	2. Potential national surplus of capacity.
3. Hands-on experience	3. Non-leading edge experience; less valuable
4a. Direct control of resources and priority-setting	4a. Sperry/DSS management may be diverted from applications to foundation/tools
4b. More insulation from ATT, RBOC, OCC coordination and quality problems.	

2. MARKET SIZING

- Forecasts
- Industry Sizing
- Other Sizing
- Definitions

FORECASTS

INPUT

DSS FORECASTS

I. Background and Assumptions

- A. 1983 DSS Penetration
- B. DSS Plans of Companies
- C. Industry Segment Factors
- D. DSS Service Delivery Modes
- E. Customer Size Variables
- F. Summary of Assumptions

II. Forecasts

- A. Methodology
- B. By Individual Target Industry
- C. By All Target Industries
- D. By Service Delivery Mode

APPENDIX D: FORECAST METHODOLOGY

I BACKGROUND AND ASSUMPTIONS

A 1983 Penetration

- 95% of respondents already have DSS applications.
  - They average approximately 3 applications per company, i.e., about 0.5% of all applications.
  - Many of these are small, almost trivial, analytic downloading applications.
  - However, many are ambitious, operatons-oriented applications.
- Vendor participation in these types of applications is high (over 50%).
  - Even more striking is expected vendor participation of over 80% for applications in the pipeline (concept or planning).
- Because this vendor participation rate is over twice as high as average, the 1983 DSS share of the information services market is approximately 1-1½%.
  - The low range is 0.5%.
  - The high range is 1.5%.

B Plans of Companies

- The single most striking result of the DSS survey was that over three quarters of companies interviewed expected that "most" applications that are now host-based will have a considerable amount of their functionality taken over by microcomputers in 3 to 5 years.

- The three-quarters who are positive divide into three groups of approximately equal sizes: These groups are at three stages of acceptance:
    - The early innovators, who are very sure that the DSS approach is correct. Most of these are already starting to act.
    - The followers, who are somewhat less sure, but have plans which they will put in motion, but less aggressively.
    - The wait-and-sees, who are positive in principle, but will proceed a more cautiously.
- The remaining quarter are somewhat doubtful of the DSS principle and/or would not expect to see most of their applicastions becoming DSS in the medium term.
- While virtually all companies are experimenting with DSS applications, for projection purposes it is useful to view the four types of companies as successively phasing into DSS applications.
    - Group 1, the "early innovators", are assumed to have already started.
    - The other three groups will phase in every 1½ years (high assumption) or 2 years (low assumption).
- Similar assumptions can also be made regarding:
    - The percentage of a company's "applications portfolio" that will be made up of DSS applications.
    - The period of time it will take to reach this "steady state".
- While respondents probably do in fact intend "most" applications to be DSS type, it is very hard for them to state precise systems plans more than about two years in the future. Hence, INPUT believes that a steady-state DSS percentage of application portfolio would be 50-65%.

- Companies will reach this steady state position before the 8 years that is the normal life for an application.
  - Respondents agreed with the range of 3-5 years.
  - INPUT believes that the outer portion of the range is more realistic and has assigned 5 years as the high end assumption and 6 years as the low end assumption.

C Industry Segment Factors

- Industry sectors do not appear to be a strong segmenting force in and of themselves. Discrete manufacturing companies appear to be somewhat more aggressive in their DSS orientation and process manufacturing somewhat less so, but in both cases not significantly more than other industry groups.
- The position of individual firms, departments and even small groups of people appear to be at least as important driving forces, particularly in the intitial stages of DSS development.
- There is little questions, though, that a successful DSS strategy should be industry-and application-focused.

D Service Delivery Modes

- DSS services will be made up, at least initially, of the standard components of Information Services, i.e.,
  - Software
  - Professional Services
  - Remote Computing (including underlying communications transport and data base information delivery).

  - Turnkey Systems (which will undergo a change and not be the standalone systems they generally are now).

- INPUT's 1983-1988 Information Service figures are used as the basis for each of the four delivery modes (with the Turnkey adjustment previously noted).

  - It is assumed that at least in the medium term, the proportions of Information Services revenues claimed by the different modes would probably not change appreciably. (or, to be more precise, there were equally good arguments for any mode expanding or contracting (as a result of DSS impacts).

  - RCS was the most difficult case since traditional RCS growth is falling. DSS services are well-positioned to take up the slack and, depending on how communications transport is purchased, may even help revive it.

E Customer Size Variables

- DSS markets will, at least initially, not represent much of a divergence from the current situation.

  - Data processing expenditures generally and Information Services vendors expenditures are specifically related to overall corporate revenues. While smaller companies spend a larger proportion of their revenues than larger ones (e.g., 1.75% in discrete manufacturing), they are swamped in terms of absolute numbers and absolute opportunity.

  - INPUT's recent in-depth examination of three major sectors (manufacturing, banking and insurance) indicate that similar types of needs - and willingness to use vendors - exist at all size levels.

F: SUMMARY OF ASSUMPTIONS: RANGES

Factor	Effect on Forecast: Makes Forecast Lower/Higher Lower	Higher
a) 1983 DSS Penetration	0.5%	1.5%
b) Staging delay between four customer groups	2 years	1½ years
c) DSS Proportion of applications at steady state	50%	65%
d) Time to reach steady state	6 years	5 years

2. CALCULATION OF DSS PROPORTION OF INFORMATION SERVICES MARKET

A. In order to calculate low and high percentages of ultimate DSS market penetration, the "lower" and "higher" assumptions (summarized in section 1F above) were each inserted into the following formula to produce the average increase per year in DSS use until a steady state of DSS use was reached:

$$\frac{\text{Steady state \% (from 1F3)}}{\text{Years in buildup (from 1F4)}} = X$$

B. The resulting percent increase ("X" above) is then divided by four to find the average percent increase for each of the four customer types described in Section 1B.

- The percent increase is 2.1% using low assumptions ($\frac{50}{6} \div 4$)
- The percent increase is 3.25% using high assumptions ($\frac{65}{5} \div 4$)

C. These percents were applied to the fast and slow staging assumptions contained in the following two exhibits (substituting for "X").

D. The cumulative DSS proportion for Information Service markets is shown in Table I.

DSS MARKET SIZING WORKSHEET: 1½ YEAR STAGING

ADDITIONAL DSS PERCENTAGE OF EXPENDITURES

Customer Type	1984	1985	1986	1987	1988
1.	X	X	X	X	X
2.		0.5X	X	X	X
3.				X	X
4.					0.5X
Year Total	1X	1.5X	2X	3X	3.5X
Cumulative Total*	1X	2.5X	4X	7X	10.5X

* Add additional 1.5% for 1983 base

DSS MARKET SIZING WORKSHEET: 2 YEAR STAGING

ADDITIONAL DSS PERCENTAGE OF EXPENDITURES

Customer Type	1984	1985	1986	1987	1988
1.	X	X	X	X	X
2.			X	X	X
3.					X
4.					
Year Total	1X	1X	2X	2X	3X
Cumulative Total*	1X	2X	4X	6X	9X

* Add additional 0.5% share for 1983 base

TABLE I

CUMULATIVE DSS PROPORTION OF INFORMATION SERVICES MARKET: 1983-88

	Low	High	Midpoint
1983	0.5 %	1.5 %	1.0 %
1984	2.6	4.75	3.7
1985	4.7	9.6	7.2
1986	8.9	14.5	11.7
1987	13.1	24.25	18.7
1988	19.4	35.6	27.5

DSS MARKET SIZE: MANUFACTURING SECTOR

Year	Total IS*	DSS Share (%)			DSS Share ($ mill)		
		Low	Med	High	Low	Mid	High
1983	$ 7.6	0.5%	1.0 %	1.5 %	$ 38	$ 76	$ 114
1984	$ 9.2	2.6	3.7	4.75	239	340	437
1985	11.4	4.7	7.2	9.6	535	820	1,094
1986	14.1	8.9	11.7	14.5	1,250	1,650	2,050
1987	17.5	13.1	18.7	24.25	2,300	3,300	4,250
1988	21.7	19.4	27.5	35.6	4,200	5,950	7,700

* Excludes 45% of integrated systems (turnkey): $ bill

DSS MARKET SIZE:

Year	Total IS*	DSS Share (%) Low	Med	High	DSS Share ($ mill) Low	Mid	High
1983	$ 3.5	0.5%	1.0 %	1.5 %	$ 18	$ 35	$ 53
1984	4.2	2.6	3.7	4.75	109	155	200
1985	5.0	4.7	7.2	9.6	235	360	480
1986	5.9	8.9	11.7	14.5	525	690	855
1987	7.1	13.1	18.7	24.25	930	1,325	1,725
1988	8.5	19.4	27.5	35.6	1,650	2,350	3,025

* Excludes 45% of integrated systems (turnkey): $ bill

DSS MARKET SIZE: RETAIL SECTOR

		DSS Share (%)			DSS Share ($ mill)		
Year	Total IS*	Low	Med	High	Low	Mid	High
1983	$ 0.8	0.5%	1.0 %	1.5 %	$ 4	$ 8	$ 12
1984	0.9	2.6	3.7	4.75	23	33	43
1985	1.1	4.7	7.2	9.6	52	79	106
1986	1.4	8.9	11.7	14.5	124	163	203
1987	1,7	13.1	18.7	24.25	223	318	412
1988	2.0	19.4	27.5	35.6	380	550	712

* Excludes 45% of integrated systems (turnkey): $ bill

DSS MARKET SIZE: WHOLESALE SECTOR

Year	Total IS*	DSS Share (%)			DSS Share ($ mill)		
		Low	Med	High	Low	Mid	High
1983	$ 1.5	0.5%	1.0 %	1.5 %	$ 7	$ 15	$ 23
1984	1.8	2.6	3.7	4.75	46	67	86
1985	2.2	4.7	7.2	9.6	103	158	211
1986	2.5	8.9	11.7	14.5	222	293	363
1987	3.1	13.1	18.7	24.25	406	580	752
1988	3.7	19.4	27.5	35.6	718	1,018	1,317

* Excludes 45% of integrated systems (turnkey): $ bill

DSS MARKET SIZE: TRANSPORTATION SECTOR

		DSS Share (%)			DSS Share ($ mill)		
Year	Total IS*	Low	Med	High	Low	Mid	High
1983	$ 0.3	0.5%	1.0 %	1.5 %	$ 2	$ 3	$ 5
1984	0.45	2.6	3.7	4.75	11	17	21
1985	0.6	4.7	7.2	9.6	28	43	58
1986	0.8	8.9	11.7	14.5	71	94	116
1987	1.00	13.1	18.7	24.25	131	187	243
1988	1.25	19.4	27.5	35.6	242	343	445

* Excludes 45% of integrated systems (turnkey): $ bill

DSS MARKET SIZE: ALL TARGET SECTORS

Year	Total IS*	DSS Share (%) Low	DSS Share (%) Med	DSS Share (%) High	DSS Share ($ Bill) Low	DSS Share ($ Bill) Mid	DSS Share ($ Bill) High
1983	$ 13.7	0.5%	1.0 %	1.5 %	$ .070	$ .140	$ .210
1984	16.5	2.6	3.7	4.75	.430	.610	.780
1985	20.3	4.7	7.2	9.6	.950	1.460	1.950
1986	24.7	8.9	11.7	14.5	2.2	2.9	3.6
1987	30.4	13.1	18.7	24.25	4.0	5.7	7.4
1988	37.2	19.4	27.5	35.6	7.2	10.2	13.2

* Excludes 45% of integrated systems (turnkey): $ bill

DSS MARKET SIZING: BY DELIVERY MODE ($ BILL)

	1983	1984	1985	1986	1987	1988
Processing						
Low	$ .030	$ .180	$ .350	$ .760	$1.3	$ 2.2
Mid	.060	.240	.550	1.020	1.9	3.1
High	.090	.310	.730	1.240	2.4	4.0
Software						
Low	.020	.120	.310	.760	1.5	2.9
Mid	.040	.180	.470	1.020	2.1	4.1
High	.060	.230	.620	1.240	2.8	5.2
Professional Services						
Low	.010	.100	.210	.470	.8	1.5
Mid	.030	.140	.320	.620	1.2	2.1
High	.040	.180	.430	.760	1.6	2.7
Turnkey*						
Low	.010	.030	.080	.180	.340	.62
Mid	.010	.050	.120	.240	.480	.90
High	.020	.060	.160	.290	.620	1.2
Total						
Low	.070	.430	.950	2.2	4.0	7.2
Mid	.140	.610	1.460	2.9	5.7	10.2
High	.210	.780	1.950	3.6	7.4	13.2

* Excludes hardware component

INDUSTRY SIZING

INDUSTRY SEGMENTATION MATERIALS

- Analysis Factors, ie., what is important and why in selecting an industry?

- Applying these factors to major potential segments:
  - Manufacturing
  - Distribution
  - Banking
  - Insurance
  - Medical
  - Government

- A rating of the potential intensity of DSS use:
  - Intra-enterprise
  - Intra-segment
  - Inter-segment (between all segments)

- Segment summary (numeric).

- Segment relationships summary (graphical).

- Recommendations

INDUSTRY SEGMENT ANALYSIS FACTORS

- Potential size (1988).
- Additional segmentation by industry type.
  - A number of cohesive subsectors are desirable.
  - Too many and/or diffuse subsectors may make it difficult to achieve economies of scale.
- Additional segmentation by applications.
  - This is desirable, up to a point, to provide opportunities for additional specialization. If applications are too isolated, DSS opportunities will not be as large, however.
- Relative current maturity of DSS-type activities vs future potential.
  - Optionally, there should be widespread acceptance of the principle, with limited implementation to date.
  - This applies to intra-enterprise, intra-segment and inter-segment areas.
- The competitive environment:
  - The number, and especially, the dominance of firms in traditional information services (since dominant firms could adapt to the DSS environment and/or block new entrants.)
  - The extent to which DSS-type services are now being offered.

SEGMENT ANALYSIS: MANUFACTURING

- 1988 DSS Size: $6.0 billion.

- Additional segmentation by industry type:
  - Several dozen sub-segments based on specific industries.

- Additional segmentation by applications functions:
  - Many stand-alone functional segments now:
    - . MRP and subsectors
    - . CAD
    - . CAM
    - . Financial Management
  - Probably more coalescing and linking in future (CIM, CAE, MRP II).

- Relative maturity of existing DSS-type activities vs. potential:
  - Intra-enterprise: Low now; high in future.
    - . Host-based or stand-alone turnkeys still predominate.
    - . Trends to decentralized management/flexible production will encourage DSS.
    - . High perceived need.
  - Intra-segment: Low now; high in future.
    - . Much planning for supplier/manufacturer systems (eg., auto industry, Pittsburgh manufacturers).
    - . Medium/high perceived need.
  - Inter-segment: Low now, high in future.
    - . Many plans or experiments on a one-for-one basis with wholesale and transportation.
    - . High conceptual perceived need, but critical mass needed for success.

- DSS Competitive environment.
  - Many traditional host or turnkey vendors (eg., ASK, Xerox, Martin-Marietta, BCS, MDS, CAD/CAM Vendors).
  - Leading electronic data interchange vendors (McAuto/Tymshare, GEISCO, SMC-Kleinschmidt, Informatics) not yet focused on micro attributes, still present themselves as bridge between mainframes.
  - Field fragmented and highly competitive: No dominant vendor.

SEGMENT ANALYSIS: DISTRIBUTION

- 1988 DSS Size: $1.9 billion (includes parts of retail, transportation and all of wholesale).

- Additional segmentation by industry type:
  - Many (at least dozens) industry-oriented subsectors.

- Additional segmentation by applications functions:
  - Distribution functions are increasingly monolithic and not offerable separately.

- Relative maturity of existing DSS-type activities vs. potential.
  - Intra-enterprise: Low/medium now; high potential.
    - Highly competitive business, especially since deregulation: DSS-type activities seen as way to cut costs and improve service
  - Intra-segment: Low now; medium potential.
    - Often little community of interest between competitors in same subsector.
    - Airlines (passengers) and rails (cars) have proprietary systems.
  - Inter-segment: Low/medium now; high potential.
    - Many experiments.
    - TDCC providing structure and lead.
    - Critical mass (customers, transactions) agreed as major factor in success.

- DSS Competitive Environment.
  - Leading RCS firms are moving into electronic data interchange.
    - GEISCO
    - Informatics
    - McAuto/Tymshare
  - Other specialist informediaries (eg., Comtrac/First Chicago, SMC-Kleinschmidt).
  - Proprietary systems.
  - Moving slowly to true DSS.

SEGMENT ANALYSIS: BANKING

- 1988 DSS Size: $3.7 billion.

- Additional segmentation by industry type: Relatively few.
  - Banking/Thrifts
  - Brokerage

- Additional segmentation by applications functions:
  - Many subfunctions (eg., Personal Loan, Corporate Loan, Personal Trust, Corporate Trust, Trading, Demand Deposits, Customer Information Systems, Portfolio Management, Stock Transfer, Cash Management, Letter of Credit, etc.).

- Relative maturity of existing DSS-type activities vs. Potential.
  - Intra-enterprise: Medium now; high potential.
    - Many DSS-type "turnkeys" in recent years.
  - Intra-segment: Medium now; high potential.
    - Interbank transfers have always been important.
  - Inter-segment: Low/medium now; medium to high potential.
    - Conversion of treasury workstations from terminals to micros.
    - Customer-Bank transfers could be large business (videotex) but future unclear.

- DSS Competitive environment.
  - Highly competitive.
  - Strong organizations competing for interbank business (Federal Reserve, SWIFT, Bankcards, Bank Consortiums).
  - Bank software/services: successful market-directed firms: EDS, Hogan, SEI, NDC, Systematics.
  - Unsuccessful firms who are not market oriented: CSC, ADP, Anacomp.
  - Highly volatile. Changes in:
    - Technology
    - Market Needs
    - Political/Legal-environment

SEGMENT ANALYSIS: INSURANCE

- 1988 DSS Size: $1.5 billion.

- Additional segmentation by industry type: Relatively little.
  - Life
  - Property/Casualty (P&C)
  - Group
  - Agencies

- Additional segmentation by applications functions:
  - Many subfunctions being independently addressed.

- Relative maturity of existing DSS-type activities vs. potential.
  - Intra-enterprise: Low/medium now; high potential.
    - . PMS host-based systems have lock on P&C market.
    - . Much interest in stand-alone PC's with some ties to hosts.
  - Intra-segment: High/medium now; high potential.
    - . High in P&C (IVANS).
    - . Medium in others (various Life company experiments).
  - Inter-segment: Low now; moderate potential.
    - . Some experiments with banks.

- DSS Competitive environment.
  - IBM has P&C segment at least temporarily locked up for intra-segment.
  - Interesting intra-enterprise micro-based system for P&C industry offered by Data Concepts, Inc.
  - Many agency turnkey systems (linkable via IVANS).
  - More traditional competition in Life and Group areas.

SEGMENT ANALYSIS: MEDICAL

- 1988 DSS Size: $1.2 billion.

- Additional segmentation by industry type: Relatively little.

  - Hospital Administration
  - Physician Groups
  - Labs, etc.

- Additional segmentation by applications functions:

  - Administrative/Financial
  - Clinical
  - Instrumentation

- Relative maturity of existing DSS-type activities vs. potential.

  - Intra-enterprise: Medium now; high potential.
    - Linked mini/micros in hospitals.
  - Intra-segment: Low now; low/medium potential.
    - Little potential for hospital-hospital or physician-hospital in most functional areas.
      - Some potential for exchange of clinical data.
  - Inter-segment: Low now; low/medium potential.
    - Health insurance claims/payments have had some experimental work.

- DSS Competitive environment.

  - HBO & Co. linked hospital department mini/micros: very well accepted.
  - McAuto & SMC, dominant RCS processors have taken hesitant DSS-like steps.
  - Physician area: Mini, now micro, turnkeys predominant.

SEGMENT ANALYSIS: GOVERNMENT

- 1988 DSS Size: $2.3 billion (Federal and State/Local; "Embedded Computer Systems" - weapons systems software - excluded).

- Additional Segmentation by organization type:
  - Hundreds of major political subdivisions.
  - Most jurisdictions have dozens of operationally independent agencies.
  - May be difficult to combine into cohesive niches.

- Additional segmentation by application functions:
  - Hundreds, if not thousands (e.g., from traffic ticket processing to military inventory support).
  - In some cases, may be difficult to package applications to meet diverse requirements.

- Relative maturity of existing DSS-type activities vs potential.

- Intra-enterprise: Low now; medium potential.
  - Limitations: Political boundaries, financial and human resources, difficult to change unique ways of doing business.
- Intra-segment: Low now; low/medium potential.
  - Same limitations.
- Inter-segment: Low now; low/medium potential.
  - Some need to interface with commercial organizations.
  - Same limitations.

o DSS Competitive environment.

- Major Federal-oriented RCS and Professional Services firms will evolve with market's needs.
- Many small specialist firms exist with special ties to particular companies.
- Will often be difficult to achieve focus or economics of scale in this diffuse marketplace.

POTENTIAL INTENSITY OF DISTRIBUTED SYSTEM USE BY SEGMENT: INTRA-ENTERPRISE, INTRA-SEGMENT, INTER-SEGMENTS

	Intra-Segment	Agriculture, Construction, Other	State/Local Government	Federal Government	Utilities	Education	Services	Medical	Insurance	Banking/Finance	Transportation	Retail	Wholesale	Manufacturing
Manufacturing														
Wholesale														10
Retail													10	5
Transportation												10	10	10
Banking/Finance											6	5	5	5
Insurance										7	1	1	1	2
Medical									5	5	1	1	4	3
Services								1	1	5	1	1	3	2
Education							1	2	1	2	1	1	2	1
Utilities						1	1	1	1	5	2	1	2	3
Federal Government					3	3	1	2	3	3	3	1	3	3
State/Local Government				4	3	2	1	2	1	2	1	1	2	1
Agriculture, Construction, Other			2	3	3	1	1	1	1	5	5	2	4	4
Intra-Segment		2	6	5	4	4	2	3	10	10	10	3	5	10
Intra-Enterprise	☒	4	6	6	8	6	6	10	10	10	10	6	8	10

1 = Low intensity potential

10 = High intensity potential

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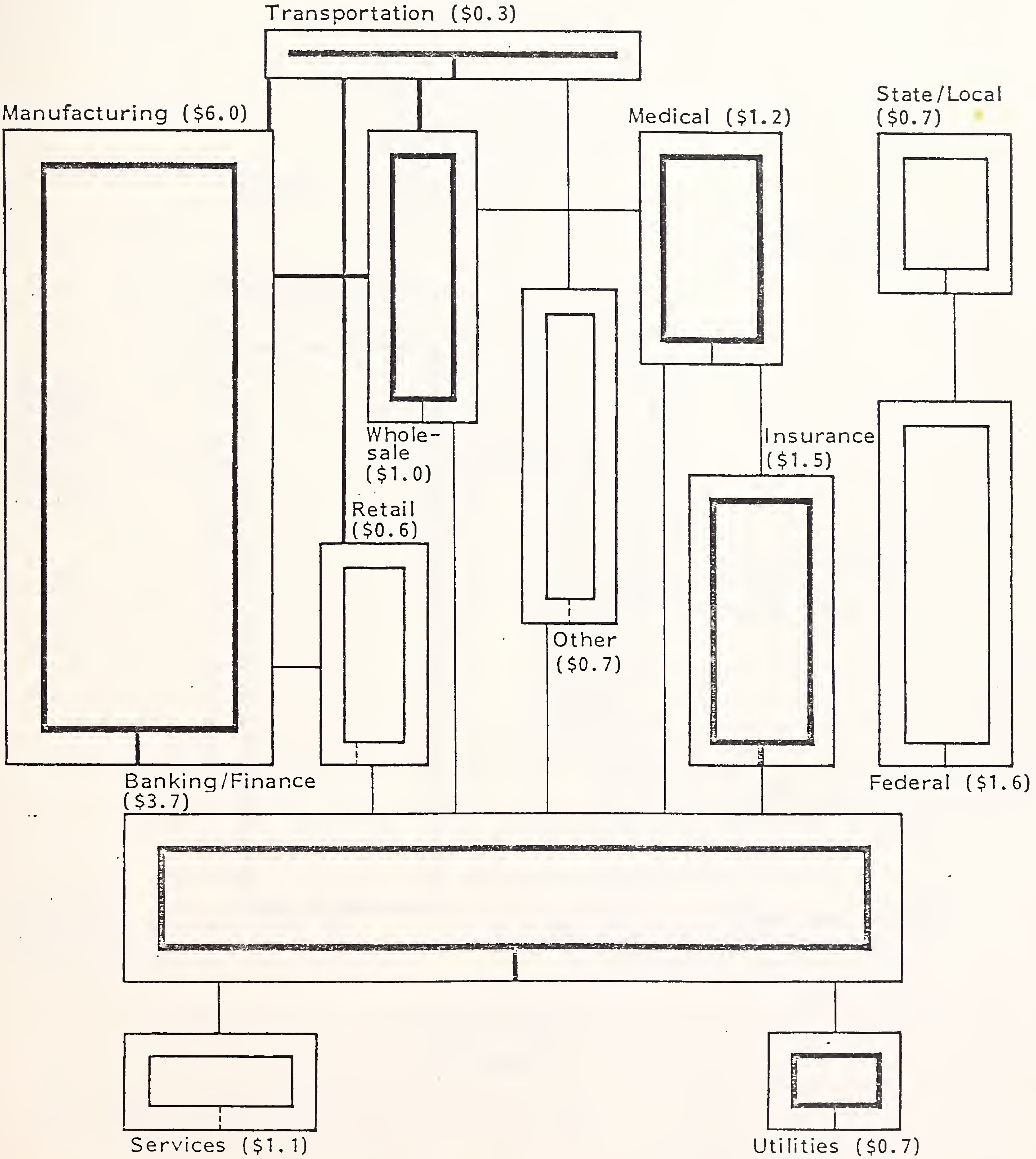
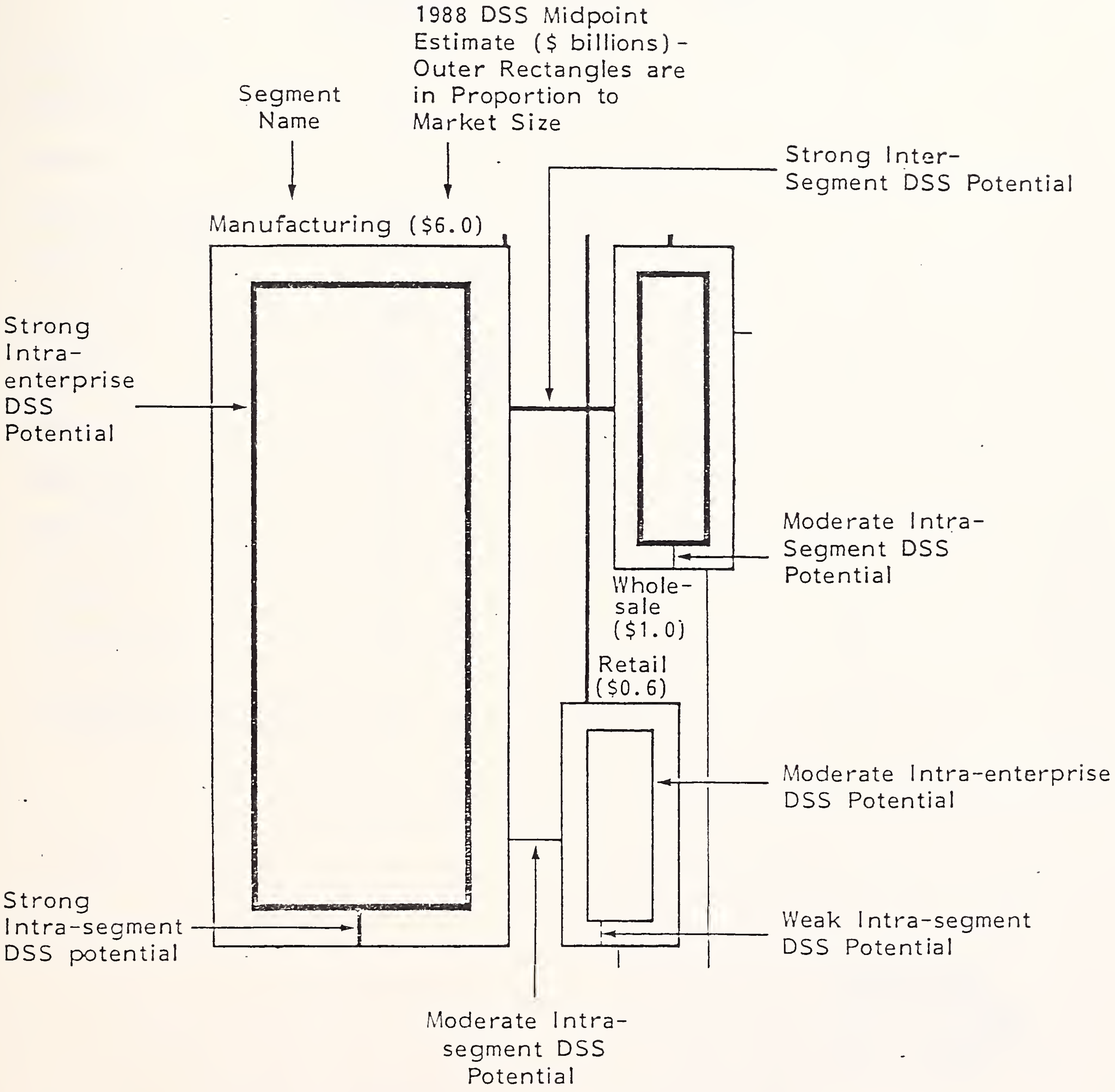
DSS SEGMENT RELATIONSHIPS

(See Key on Next Page)



DSS SEGMENT RELATIONSHIPS: EXPLANATORY KEY


Segment Name
1988 DSS Midpoint Estimate ($ billions) - Outer Rectangles are in Proportion to Market Size
Strong Inter-Segment DSS Potential
Manufacturing ($6.0)
Strong Intra-enterprise DSS Potential
Moderate Intra-Segment DSS Potential
Whole-sale ($1.0)
Retail ($0.6)
Moderate Intra-enterprise DSS Potential
Strong Intra-segment DSS potential
Weak Intra-segment DSS Potential
Moderate Intra-segment DSS Potential

NOTE: Weak inter-segment DSS potential lines omitted for clarity.

DSS Summary

	Ratings		
	Intra-Enterprise	Intra-Industry	Number of 8, 9, 10 Inter-Industry Ratings
Manufacturing	10	10	2
Wholesale	8	5	3
Retail	6	*	2
Transportation	10	10	3
Banking/Finance	10	10	0
Insurance	10	10	0
Medical	10	*	0
Services	6	*	0
Education	6	4	0
Utilities	8	4	0
Federal	6	5	0
State/Local	6	6	0
Agriculture, Construction, Other	4	*	0

* Under 4

Ratings Key

8-10 = Strong
4-7 = Moderate
1-3 = Weak

INDUSTRY SEGMENTS: RECOMMENDATIONS

- Manufacturing/Distribution: Primary Recommendation.
  - High potential within manufacturing and transportation both intra-enterprise and intra-segment. Moderate in retail and wholesale.
  - Many industry niches.
  - High inter-connectivity between segments.
  - Good entry timing: widespread agreement on DSS-type needs, in early stages of implementation.
  - Competition: Widespread in traditional information service offerings but not dominant firms.
- Banking Finance: Secondary recommendation (i.e., attack a single segment initially).
  - High intra-enterprise and intra-segment potential.
  - Few subsegment industry niches.
  - Moderate, but extensive, inter-segment connectivity.
  - Fair entry timing: already many DSS-type implementations.
  - Competition: Widespread in traditional offerings with dominant firms emerging. Many DSS-type offerings.
- Insurance: Defer entry consideration until IVANS situation clearer.
  - High potential intra-enterprise and intra-segment.